


American College of Medical Genetics
Medical Genetics: Translating Genes Into Health


Medical Genetics Training in the USA

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Evolution of Medical Genetics Training in the United States


- ♦ **American Board of Medical Genetics (1982)**
 - Clinical Genetics
 - PhD Medical Genetics
 - Clinical Cytogenetics
 - Clinical Biochemical Genetics
- ♦ **Recognized by ABMS as 24th primary board of medicine(1992)**
 - American Board of Genetic Counseling is formed (1993)
- ♦ **Clinical Molecular Genetics added in 1997**
- ♦ **Dual Board training expands**
- ♦ **First clinical genetics subspecialty developing**



Is Genetics a Primary Specialty or a Subspecialty?


Member Boards
American Board of Medical Specialties

Algeria & Immunology 1000 North 17th Street P.O. Box 1000 Pittsburgh, PA 15216-0001 (412) 624-1000	Anesthesiology 1000 North 17th Street P.O. Box 1000 Pittsburgh, PA 15216-0001 (412) 624-1000	Colon & Rectal Surgery 1000 North 17th Street P.O. Box 1000 Pittsburgh, PA 15216-0001 (412) 624-1000
Cardiovascular Medicine 1000 North 17th Street P.O. Box 1000 Pittsburgh, PA 15216-0001 (412) 624-1000	Emergency Medicine 1000 North 17th Street P.O. Box 1000 Pittsburgh, PA 15216-0001 (412) 624-1000	Family Medicine 1000 North 17th Street P.O. Box 1000 Pittsburgh, PA 15216-0001 (412) 624-1000
Internal Medicine 1000 North 17th Street P.O. Box 1000 Pittsburgh, PA 15216-0001 (412) 624-1000	Medical Genetics 1000 North 17th Street P.O. Box 1000 Pittsburgh, PA 15216-0001 (412) 624-1000	Neurological Surgery 1000 North 17th Street P.O. Box 1000 Pittsburgh, PA 15216-0001 (412) 624-1000
Nuclear Medicine 1000 North 17th Street P.O. Box 1000 Pittsburgh, PA 15216-0001 (412) 624-1000	Oncology & Hematology 1000 North 17th Street P.O. Box 1000 Pittsburgh, PA 15216-0001 (412) 624-1000	Ophthalmology 1000 North 17th Street P.O. Box 1000 Pittsburgh, PA 15216-0001 (412) 624-1000
Orthopedic Surgery 1000 North 17th Street P.O. Box 1000 Pittsburgh, PA 15216-0001 (412) 624-1000	Otolaryngology 1000 North 17th Street P.O. Box 1000 Pittsburgh, PA 15216-0001 (412) 624-1000	Pediatrics 1000 North 17th Street P.O. Box 1000 Pittsburgh, PA 15216-0001 (412) 624-1000
Pathology 1000 North 17th Street P.O. Box 1000 Pittsburgh, PA 15216-0001 (412) 624-1000	Physical Medicine & Rehabilitation 1000 North 17th Street P.O. Box 1000 Pittsburgh, PA 15216-0001 (412) 624-1000	Plastic Surgery 1000 North 17th Street P.O. Box 1000 Pittsburgh, PA 15216-0001 (412) 624-1000
Preventive Medicine 1000 North 17th Street P.O. Box 1000 Pittsburgh, PA 15216-0001 (412) 624-1000	Psychiatry & Neurology 1000 North 17th Street P.O. Box 1000 Pittsburgh, PA 15216-0001 (412) 624-1000	Radiation 1000 North 17th Street P.O. Box 1000 Pittsburgh, PA 15216-0001 (412) 624-1000
Respiratory 1000 North 17th Street P.O. Box 1000 Pittsburgh, PA 15216-0001 (412) 624-1000	Thoracic Surgery 1000 North 17th Street P.O. Box 1000 Pittsburgh, PA 15216-0001 (412) 624-1000	Urology 1000 North 17th Street P.O. Box 1000 Pittsburgh, PA 15216-0001 (412) 624-1000




Meeting Changing Needs

- ♦ **Roles of medical geneticists are evolving**




“Traditional” Roles

- ♦ **Dysmorphology**
- ♦ **Biochemical Genetics**
- ♦ **Cytogenetics**
- ♦ **Molecular Diagnosis**
- ♦ **Prenatal Diagnosis**
- ♦ **Genetic Counseling**



The Problem

- ♦ **Clinical Genetics: “The health care of a few”**
- ♦ **Genomic Medicine: “The health care of all”**



New Areas of Opportunity

- ♦ **Adult-onset single gene disorders**
 - Cancer
 - Cardiovascular disease
 - Neurological disorders
- ♦ **Multifactorial disorders**
 - Risk assessment/management
- ♦ **Pharmacogenetics**
- ♦ **Metabolic disease**
- ♦ **Educating policy-makers**

ACMG 7

Practice Settings Expanding

- ♦ **Historically an academic practice**
 - Consolidated
 - Distributed
- ♦ **HMO**
- ♦ **Private Practice**

ACMG 8

Changing Training To Meet The Workforce Needs?

- ♦ **Adult geneticist**
- ♦ **Educator geneticist**
- ♦ **Geneticist as:**
 - "risk assessor"
 - interventionalist
 - metabolic physician
 - pharmacogeneticist
 - diagnostician
 - test result interpreter

ACMG 9

Preventing Congenital Anomalies in Developing Countries (V. Penchaszadeh; Community Genetics 2002;5:61-69)

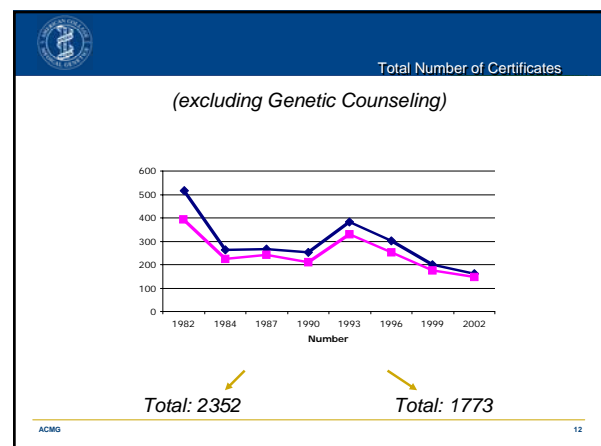
- ♦ "Conditions of underdevelopment require modalities of low cost and high impact, which differ from those implemented in wealthier countries."
- ♦ 90% of the world's births occur in "developing nations". As infectious diseases are controlled, genetic disorders and birth defects grow more prominent and need recognition even in developing nations.

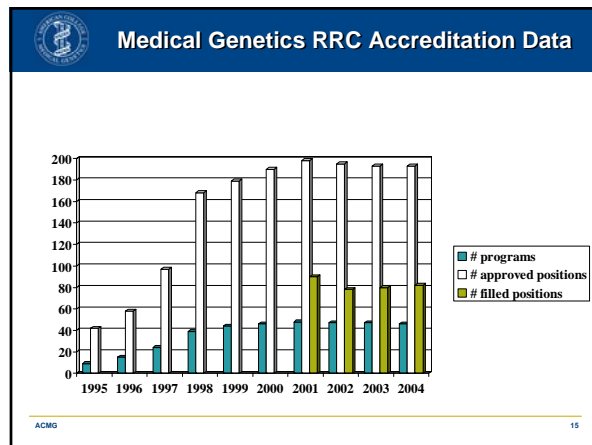
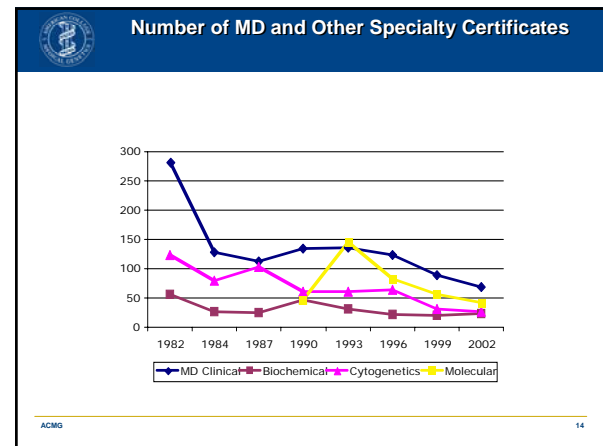
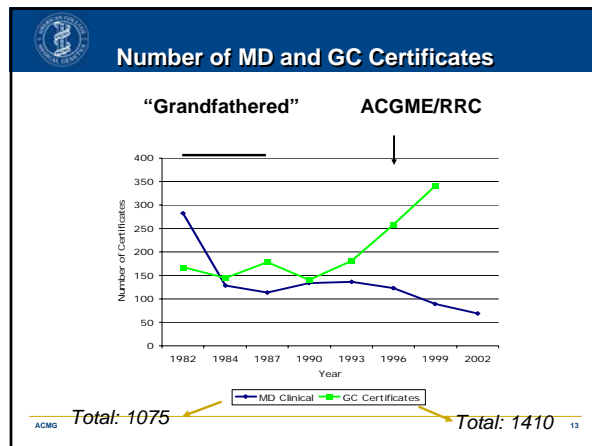
ACMG 10

ABMG Specialties

	%	#
Total Certificates		2352
Total Diplomates		1773
MD Clinical Genetics	46	1075
PhD Medical Genetics	9	151
Biochemical	9	203
Cytogenetics	23	548
Molecular	14	326
Biochemical/Molecular	2	49

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Common Themes - Training

- ♦ Role of geneticist is determined by individual countries health care delivery and financing systems.
- ♦ Generalist nature of the profession – all ages, all organ systems. Specialization within genetics units.
- ♦ Training needs to move from teaching basic science of genetics to focus on developing the skills to use the information in practice

So What?

- ♦ Determine the needs of your population and train to meet those
- ♦ Recognize that as infectious disease is better managed, the need for genetics services will rise
- ♦ Identify existing resources that can help non-genetics providers to get it right
 - ACMG resources are open and available